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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,755	07/28/2003	Max Braun	029300.50616CO	4400
23911	7590	06/10/2004	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			WONG, EDNA	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/627,755

Applicant(s)

BRAUN ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/016,127.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date July 28, 2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### ***Specification***

The disclosure is objected to because of the following informalities:

page 1, before the first line, -- , now abandoned -- should be inserted after the number "2001" (see item 11 in the Request For Filing A Patent Application Under 37 CFR 1.53(b) dated July 28, 2003).

page 6, line 21, "  $\_ > 280 \text{ nm}$ " should be amended to --  $\geq 280 \text{ nm}$  --.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

Claim 1 is objected to because of the following informalities:

#### **Claim 1**

line 2, the " ; " (semicolon) should be amended to a -- , -- (comma).

line 3, the word -- a -- should be inserted after the word "in".

line 4, the word -- a -- should be inserted after the word "in".

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

Claims **1-6** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 1**

lines 3-4, 6 and 10-11, it is unclear what are the positive process steps. The process steps should be amended to a positive, active form.

The word "by" is used twice to introduce the process steps (from claim 1, lines 3-4). It is suggested that:

the words "by addition of" in line 3 be amended to the phrase -- comprising the steps of adding --;

the words "by exchange of" in line 4 be amended to the word -- exchanging --;

the words "to produce" in line 6 be amended to the word -- producing --;  
and

the words "wherein a respective starting compound is contacted with elemental chlorine and irradiated" should be amended to the words -- contacting

a respective starting compound with elemental chlorine and irradiating --.

lines 7-10, "purified 1,1,1,3,3-pentafluorobutane" is not one of the compounds listed in the Markush group of "selected from the group consisting of pentachloroethane, 1,1,1-trifluoro-2,2,2-trichloroethane and 1,1,1,2-tetrachloro-2,2-difluoroethane" (from claim 1, lines 2-3). Thus, it is unclear what is the relationship between the purified 1,1,1,3,3-pentafluorobutane and the process for producing a chlorine-containing alkane (from claim 1, lines 1-3).

line 10, it appears that "a respective starting compound" is the same as the trichloroethylene (from claim 1, line 3); the 1,1,1-trifluoro-2-chloroethane or 1,1,1-trifluoro-2,2-dichloroethane (from claim 1, lines 5-6); or the 2,2-difluoro-2-chloroethane (from claim 1, line 7). However it is unclear if it is.

line 11, it appears that the "elemental chlorine" is the same as the chlorine recited in claim 1, line 3. However, it is unclear if it is. If it is not, then what is the difference between the chlorine and the elemental chlorine?

#### Claim 4

line 2, the word "(absolute)" is indefinite. It is unclear whether the narrower limitation in the parentheses is, in fact, a claim limitation.

Claim 5

line 2, it appears that the “unsaturated impurities” are the same as the unsaturated compounds with C-C double bonds or C-C triple bonds recited in claim 1, line 9. However, it is unclear if they are. If they are not, then what is the difference between the unsaturated compounds with C-C double bonds or C-C triple bonds and the unsaturated impurities?

Claim 6

line 1, it appears that the “elemental chlorine” is the same as the chlorine recited in claim 1, line 3. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word “wherein”.

line 2, “the stoichiometrically required amount” lacks antecedent basis.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- I. Claims **1-3** are rejected under 35 U.S.C. 102(b) as being anticipated by **Muller et al.** (“Die Photochemischen Chlorierungun von cis-Dichlorathylen zu Tetrachlorathan und

von Trichloräthylen zu Pentachloräthan", Z. Physik. Chem. B (1937), pp. 455-461).

Muller teaches a process for producing a chlorine-containing alkane selected from the group consisting of pentachloroethane, 1,1,1-trifluoro-2,2,2-trichloroethane and 1,1,1,2-tetrachloro-2,2-difluoroethane comprising the steps of:

(a) adding chlorine to trichloroethylene (= chlorierung des trichloräthylens) in a liquid phase to produce pentachloroethane;

(b) contacting a respective starting compound (= trichloroethylene) with elemental chlorine (= chlorierung); and

(c) irradiating with UV light having a wavelength of  $\lambda \geq 280$  nm (= 436 m $\mu$ ) [page 455, lines 1-12].

The process is carried out in the liquid phase (page 455, lines 1-12).

The process is carried out at a temperature in the range from room temperature to 200°C (= 80°-120°C) [page 455, lines 6-7].

**II. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by CN 1097189.**

The CN reference teaches a process for producing a chlorine-containing alkane selected from the group consisting of pentachloroethane, 1,1,1-trifluoro-2,2,2-trichloroethane and 1,1,1,2-tetrachloro-2,2-difluoroethane comprising the steps of:

(a) exchanging hydrogen for chlorine in a gas phase to produce 1,1,1-trifluoro-2,2,2-trichloroethane (= CFC 113a) from 1,1,1-trifluoro-2-chloroethane (= HCFC 133a);

(b) contacting a respective starting compound (1,1,1-trifluoro-2-chloroethane = HCFC 133a) with elemental chlorine (= chlorine); and

(c) irradiating with UV light having a wavelength of  $\lambda \geq 280$  nm (= 2800-4000 angstroms = 280-400 nm) [abstract].

The process is carried out at a temperature in the range from room temperature to 200°C (= 100-200°C) [abstract].

III. Claims **1-4** are rejected under 35 U.S.C. 102(b) as being anticipated by **Bertocchio et al.** (US Patent No. 5,951,830).

Bertocchio teaches a process for producing a chlorine-containing alkane selected from the group consisting of pentachloroethane, 1,1,1-trifluoro-2,2,2-trichloroethane and 1,1,1,2-tetrachloro-2,2-difluoroethane comprising the steps of:

(a) exchanging hydrogen for chlorine in a gas or liquid phase (col. 3, lines 5-11) to produce 1,1,1-trifluoro-2,2,2-trichloroethane (= CFC 113a) from 1,1,1-trifluoro-2,2-dichloroethane (= HCFC 123);

(b) contacting a respective starting compound (= 1,1,1-trifluoro-2,2-dichloroethane = HCFC 123) with elemental chlorine (= chlorine) [cols. 4-5, Examples 1-2]; and

(c) irradiating with UV light having a wavelength of  $\lambda \geq 280$  nm (= 320-500 nm) [col. 2, lines 59-65].

The process is carried out at a temperature in the range from room temperature



to 200°C (= -12 to 100°C) [col. 3, lines 20-35].

The process is carried out at a pressure of 1 to 10 bar (= lower than 5 bars) [col. 26-29 and lines 33-35].

**IV.** Claims **1-5** are rejected under 35 U.S.C. 102(b) as being anticipated by **Boyce** (US Patent No. 5,944,962).

Boyce teaches a process for producing a chlorine-containing alkane selected from the group consisting of pentachloroethane, 1,1,1-trifluoro-2,2,2-trichloroethane and 1,1,1,2-tetrachloro-2,2-difluoroethane comprising the steps of:

(a) producing purified 1,1,1,3,3-pentafluorobutane (HFC 365 mfc) from 1,1,1,3,3-pentafluorobutane (col. 3, lines 38-39) that has been contaminated by unsaturated compounds with C-C double bonds or C-C triple bonds (= 1,1,1-trifluoro-3-chloropropene = HFC 245Fa) by chlorinating the unsaturated contaminating compounds;

(b) contacting a respective starting compound (=1,1,1,3,3-pentafluorobutane (HFC 365 mfc) with elemental chlorine (col. 4, line 29); and

(c) irradiating with UV light having a wavelength of  $\lambda \geq 280$  nm (= from about 290 nm to about 335 nm) [col. 6, lines 6-10; and col. 9, Example 4].

The process is carried out in the liquid phase (col. 4, lines 20-31).

The process is carried out at a temperature in the range from room temperature to 200 °C (= from about 25 °C to about 100 °C) [col. 5, lines 65-67].

The process is carried out at a pressure of 1 to 10 bar (= 15-60 psig = 1.03-4.14 bar) [col. 6, Example 1, esp., lines 63-64].

The 1,1,1,3,3-pentafluorobutane is purified by converting unsaturated impurities into chlorine-containing impurities and separating the chlorine-containing impurities (col. 4, lines 1-18 and lines 32-50; and col. 6, lines 19-40).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims **4 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Muller et al.** ("Die Photochemischen Chlorierungun von cis-Dichlorathylen zu Tetrachlorathan und von Trichlorathylen zu Pentachlorathan", Z. Physik. Chem. B (1937), pp. 455-461) as applied to claims 1-3 above.

Muller is as applied above and incorporated herein.

Muller does not teach wherein the process is carried out at a pressure of 1 to 10 bar; and wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Muller with wherein the process is carried out at a pressure of 1 to 10 bar because the pressure is a result-effective variable and one skilled in the art has the skill to calculate the pressure that would determine the success of the desired reaction to occur, e.g., a pressure to keep reactants in the liquid phase, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

As to wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount, the amount of elemental chlorine used is a result-effective variable and one skilled in the art has the skill to calculate the amount that would determine the success of the desired reaction to occur, e.g., chlorine necessary to balance the completeness of reaction with the unsaturated hydrocarbon while minimizing the reaction with the hydrofluorohalocarbon, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

**II.** Claim **6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **CN 1097189** as applied to claims 1, 3 and 4 above.

The CN reference is as applied above and incorporated herein.

The CN reference does not teach wherein the elemental chlorine is used in an

amount that is 0.9 times to 1.3 times the stoichiometrically required amount.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of the CN reference with wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount because the amount of elemental chlorine used is a result-effective variable and one skilled in the art has the skill to calculate the amount that would determine the success of the desired reaction to occur, e.g., chlorine necessary to balance the completeness of reaction with the unsaturated hydrocarbon while minimizing the reaction with the hydrofluorohalocarbon, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

III. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over as **Bertocchio et al.** (US Patent No. 5,951,830) applied to claims 1-4 above.

Bertocchio is as applied above and incorporated herein.

Bertocchio does not teach wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process

of Bertocchio with wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount because the amount of elemental chlorine used is a result-effective variable and one skilled in the art has the skill to calculate the amount that would determine the success of the desired reaction to occur, e.g., chlorine necessary to balance the completeness of reaction with the unsaturated hydrocarbon while minimizing the reaction with the hydrofluorohalocarbon, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

**IV.** Claim **6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Boyce** (US Patent No. 5,944,962) as applied to claims 1-5 above.

Boyce is as applied above and incorporated herein.

Boyce does not teach wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Boyce with wherein the elemental chlorine is used in an amount that is 0.9 times to 1.3 times the stoichiometrically required amount because the amount of elemental chlorine used is a result-effective variable and one skilled in the art has the skill to calculate the amount that would determine the success of the desired reaction to occur,

e.g., chlorine necessary to balance the completeness of reaction with the unsaturated hydrocarbon while minimizing the reaction with the hydrofluorohalocarbon, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Furthermore, Boyce teaches from about one mole to about three moles, preferable one to one and one half moles, of elemental chlorine is used per mole of unsaturated hydrocarbon contained in the partially refined mixture (col. 4, lines 20-31; and col. 4, lines 47-50).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

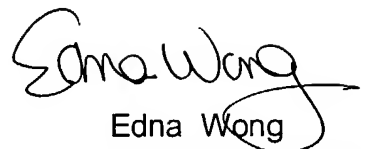
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free).

  
Edna Wong  
Primary Examiner  
Art Unit 1753

EW  
June 9, 2004